



A qualitative review of the recreational water quality monitoring programme in Taranaki

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ABSTRACT

Background and aims

Microbiologically contaminated waterways can present a health risk to those using them for recreational purposes. Each summer, regional, unitary, district and city councils and public health agencies must monitor this risk and inform the public. This qualitative review aimed to identify ways that the Taranaki summer recreational water quality monitoring programme might be improved.

Methods

Two online surveys were used to seek the opinion of the staff of territorial authorities and Taranaki Public Health and Iwi representatives with an understanding of environmental health and/or the programme. The staff survey was open for completion from the 18th of September to the 5th of October 2018. The Iwi survey was open from the 6th to the 13th of November 2018.

Findings

Staff were generally satisfied with the current programme and had a shared understanding of their responsibilities but were less happy with public communication activities. They suggested increasing public awareness of the programme and the health risks associated with recreational waterways, ensuring consistent messaging (potentially through social media platforms), reviewing testing site locations and frequency of testing, more timely reporting of results and continuing to increase coordination between agencies. It was felt that more could be done to adequately inform Iwi of test results. Iwi are less satisfied with the programme. They suggested a review of testing sites and expressed strong desire to be trained and more involved in monitoring, data interpretation, and communicating information to their people.

Conclusions and recommendations

It is recommended that a small working group should be established to action these suggestions and develop the programme into a national example of best practice. These actions will require early engagement and partnership with Iwi and community groups during their development. Taranaki DHB Public Health can help to facilitate this process.

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INTRODUCTION

During the summer months in Aotearoa, regional, unitary, district and city councils and public health agencies are tasked with assessing and monitoring the microbiological safety of recreational waterways (beaches, rivers and streams) and informing the public (1, 2). Water contaminated by human or animal faeces can contain disease-causing organisms (3) which may present a health risk to those using the water for recreational purposes (e.g. swimming) and when collecting and/or eating kaimoana. Gastroenteritis is the main health risk (2). Usually the health effects are minor and short lived but it is also possible to contract more serious diseases (2, 4). In contrast to environmental monitoring programmes, responding to the short-term variations that affect public health requires more frequent monitoring (2) of recreational water quality. Monitoring 'faecal indicator bacteria' levels indicate the amount of disease-causing organisms in the water (1). If safe threshold levels are exceeded, agencies are expected to adequately warn the public.

The Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas 2003 (2) provide a framework for the roles and responsibilities of the agencies involved in monitoring and reporting of recreational waters and are recommended by both the Ministry for the Environment (MFE) and the Ministry of Health (MoH) (2) (see Appendix 1). The purpose of the guidelines is to "help control the public health risk from microbiological contamination in recreational waters"(2). The guidelines also note that "...the Medical Officer of Health has a lead role, given his/her responsibilities under the Health Act, to ensure the proper steps are taken by the territorial local authorities to protect public health"(2).

The MFE and the MoH also recommend that local government and public health services develop regional monitoring protocols (2). These protocols should identify a lead agency, specify agreed roles and accountability, and describe how the programme will be implemented and what the management and communication education responses will be if a sampling level is exceeded (2). Of note, "consideration must be given to the role of non-regulatory groups, such as community groups and or iwi" (2) in the development of these protocols.

In Taranaki, The Taranaki Regional Council (TRC), New Plymouth District Council (NPDC), Stratford District Council (SDC) and South Taranaki District Council (STDC) and Taranaki DHB Public Health conduct a coordinated approach to assessing and monitoring the quality of "bathing" or "recreational" water and warning the public of health risks. During summer, the TRC conducts more frequent monitoring of the bacteriological quality of beaches, rivers, lakes and streams at popular recreational sites. The test results are compared with 'Alert' and 'Action' guideline levels and the district councils are responsible for erecting signs to warn the public if safe thresholds are exceeded. Taranaki DHB Public Health ensures that appropriate action is taken.

For Māori, wai (water) is an inextricable component of physical and spiritual wellbeing (5, 6) and our waterways are a taonga (treasure) (5) that warrants protection under te Tiriti o Waitangi. As such, the Resource Management Act (RMA) also makes provisions for Māori involvement in matters concerning our waterways. Māori have been formally recognised as *kaitiaki* (guardians) (5, 7) for the environment and according to te Tiriti, Māori have equal status as crown entities. This suggests that that local whanau, hapu and iwi must be considered as decision makers in matters relating to wai. Therefore, there is a need to understand their opinion about the recreational water quality monitoring

programme in Taranaki and take steps towards a shared decision-making arrangement. This review was conducted in order to inform potential improvements to programme. In particular, it is hoped that this review will better understand the needs of local Iwi.

METHODS

Initially, a series of meetings were undertaken with the staff from TRC, NPDC, SDC and STDC. The aims of the review were discussed. The attendees included those with some involvement in the recreational water quality monitoring programme at a management or operational level

Data collection was then conducted. This took the form of two online surveys using SurveyMonkey. Adapted versions of the online surveys can be found in Appendix 2. The first survey invited TRC, district council and Taranaki Public Health staff with an operational or managerial role in the monitoring programme to participate. These participants were identified through stakeholder engagement. This survey consisted of sixteen questions that were designed to evaluate the monitoring programme from an operational perspective and establish how this process can be improved. The questions were developed by the Public Health Medicine Registrar and reviewed by Taranaki DHB's Medical Officer of Health and Regulatory Services Manager and a TRC Science Manager. Sixteen invitees responded (a response rate of 94%). The survey was open for completion from the 18th of September to the 5th of October 2018.

The second survey was intended for local Iwi representatives. This survey consisted of seven questions that were designed to evaluate the monitoring programme from an Iwi perspective and establish how this process can be improved. These questions were developed by the Public Health Medicine Registrar and reviewed by TDHB's Mauri Ora Advisor, Public Health Advisor and Researcher/Analyst. The invited participants were identified based on feedback from the DHB's Chief Advisor-Maori Health, Mauri Ora Advisor and Health Equity Advisor. An introductory email containing a link to the survey was sent by the TDHB Mauri Ora Advisor to those local Iwi representatives who were most likely to have an understanding of environmental health and/or the monitoring programme. Fifteen invitees responded (response rate of 100%). This survey was open for completion from the 6th to the 13th of November 2018.

FINDINGS

The participant responses to the surveys are summarised in the sections that follow.

[Survey 1 – TRC, district councils and Taranaki Public Health staff survey responses regarding the current summer recreational water quality monitoring programme](#)

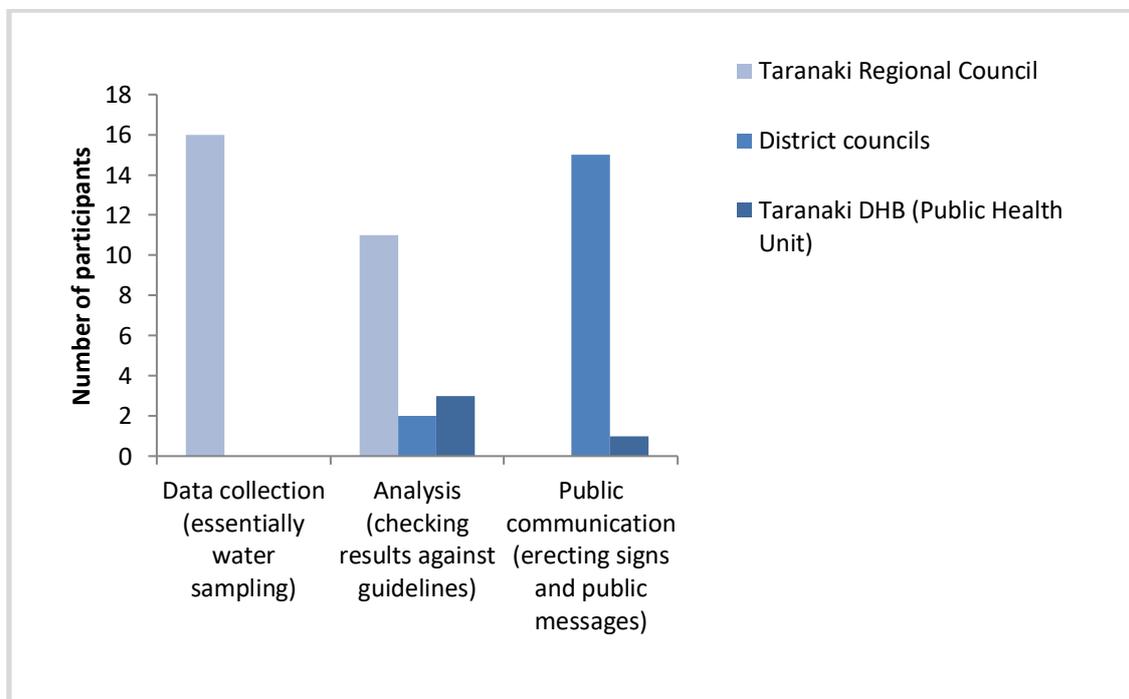
Questions 1

Do you think current recreational water quality programme is meeting national standards, as set by the 2003 Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas? (e.g. are we meeting standards for sampling criteria, the setting of roles and responsibilities etc)

Of the 14 participants that answered, all of them agreed that the programme meets national standards. Two survey participants chose not to answer this question.

Question 2

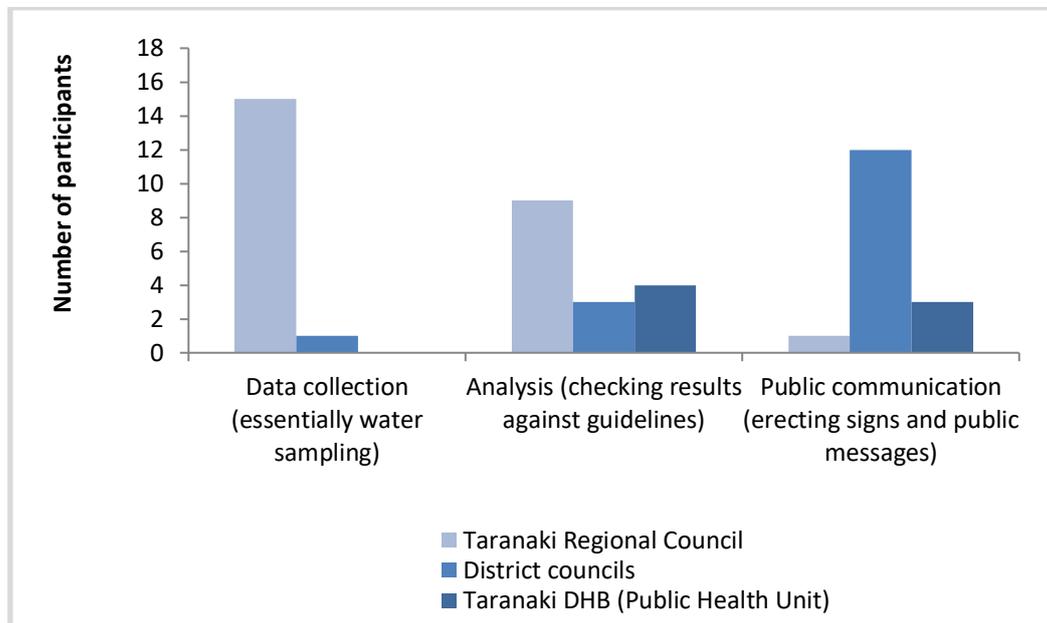
Do you know which organisation is the lead agency for the following activities? (i.e. Data collection, analysis, public communication)



All of the sixteen survey participants felt that the TRC is the lead agency for data collection and the majority of respondents felt that the TRC is also the lead agency for analysis. Nearly all (15 out of 16) respondents felt that the district councils are the lead agency for public communication. None of the respondents felt that the TRC was the lead agency for public communication.

Question 3

In an ideal world, which organisation do you think should be the lead agency for each activity?

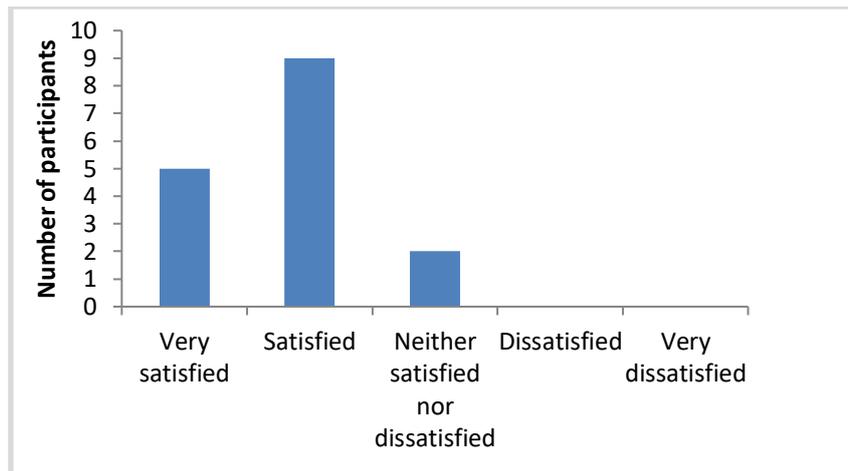


All sixteen participants answered this question. Nearly all (15 out of 16 respondents) felt that the TRC should be the lead agency for data collection, although one felt that the district council should take the lead. The majority (9 out of 16 respondents) felt that the TRC should be the lead agency for analysis, some participants suggested that Taranaki DHB Public Health and the district councils should lead this activity. The majority (12 out of 16 respondents) felt that the district councils should be the lead agency for public communication but a few suggested that Taranaki DHB Public Health and the TRC should be the lead agency.

Question 4

How satisfied are you with data collection (water sampling) activities?

All sixteen participants answered this question and nearly all (14 out of 16 respondents) were either “satisfied” or “very satisfied” with data collection activities.



Question 5

Do you have any suggestions for how data collection/water sampling could be improved?

Eight respondents made suggestions. A common suggestion was to review the testing site locations to ensure that the most frequently used waterways are tested.

The timing of testing was another theme to emerge. Three respondents suggested that testing should not be done on a Friday, whilst two respondents felt that testing should ideally be done more regularly (e.g. performing the testing on the same day each week, provided weather conditions are suitable).

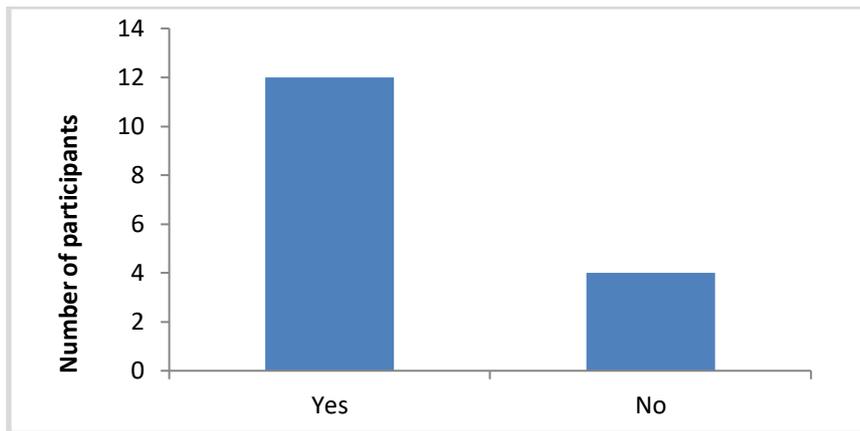
One respondent felt that testing and reporting needs to be done in a timelier manner, as delays can invalidate the test results. One respondent felt that water sampling should be made more visible to the general public.

Question 6

Do you think the data collection/ water sampling is being undertaken at the right locations?

All 16 participants answered this question. Three-quarters (12 out of 16 respondents) stated that data collection/water sampling was being undertaken at the right locations. The remaining quarter felt that data collection/ water sampling is not being conducted at the correct sites.

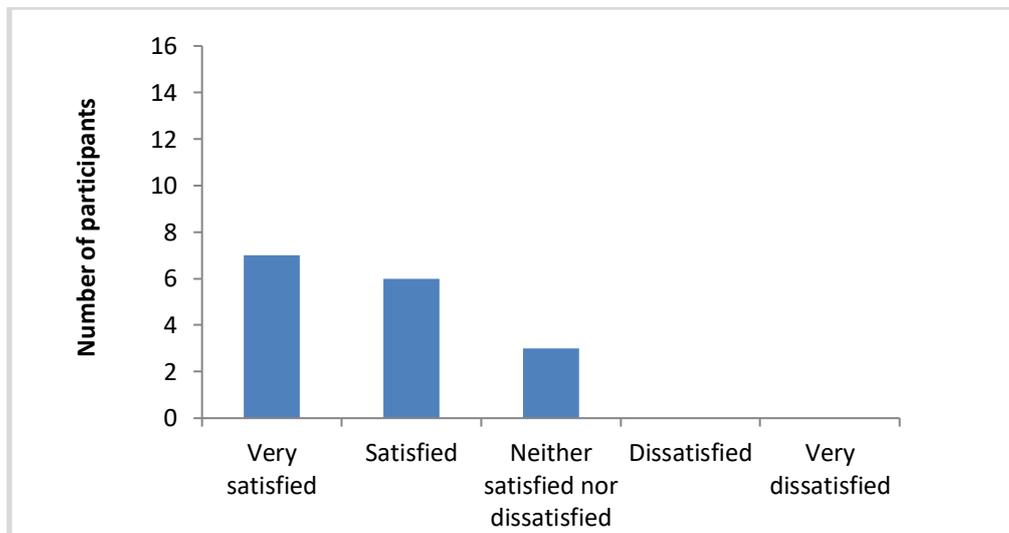
Eight respondents made further comments. Four respondents suggested that a survey is required regarding the use of recreational areas as the programme may miss out some high use sites and may also test some sites unnecessarily. However, two respondents noted the importance of having good historical background data at existing sites.



Question 7

How satisfied are you with analysis activities? (checking water quality results against relevant guidelines)

Once again, all sixteen participants responded and the majority (12 out of 16 respondents) were satisfied with analysis activities.



Question 8

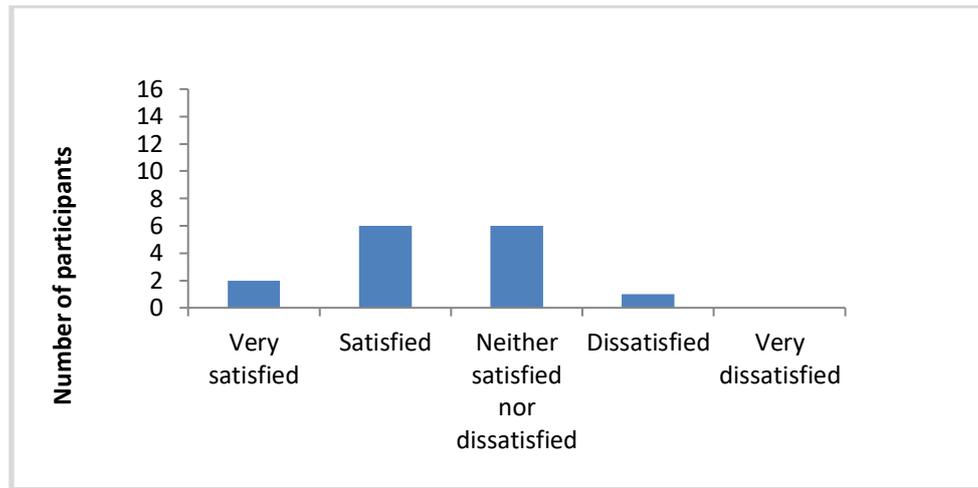
Do you have any concerns regarding analysis?

Fourteen of the sixteen participants did not have any concerns with analysis activities. One respondent commented and they felt that only stakeholders with the right skillset (e.g. Environmental Health teams) should be sent the results to make decisions and communicate messages accordingly. They felt that any misunderstanding can lead to unnecessary scaremongering.

Question 9

How satisfied are you with the public communication and the erecting of signs and public messages?

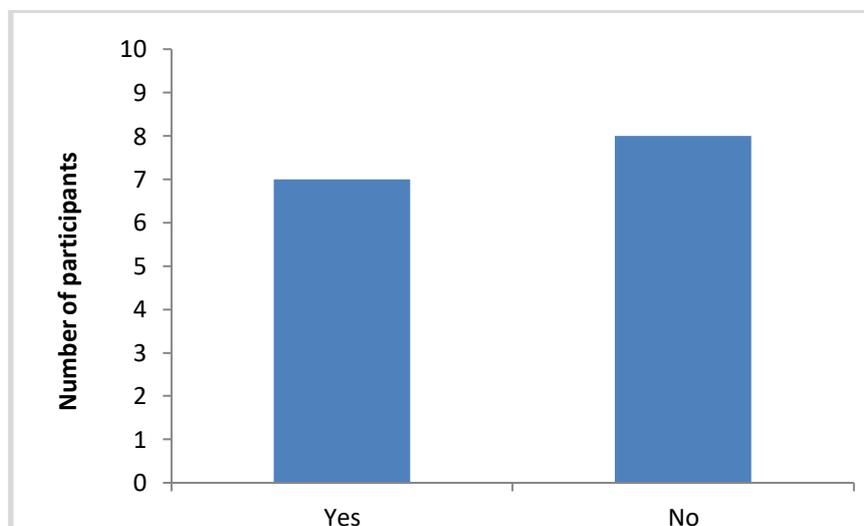
Fifteen of the sixteen participants provided a response to this question regarding public communication. There was a mixed response to this question with just over half (8 out of 15 respondents) stating that they were satisfied, compared to just under half (7 out of 15 respondents) remaining neutral or being dissatisfied.



Question 10

Do you have concerns regarding public communication?

Fifteen of the sixteen participants provide a response to this question. The response was mixed, with almost half of the respondents expressing that they had some concerns with how public communications are conducted.



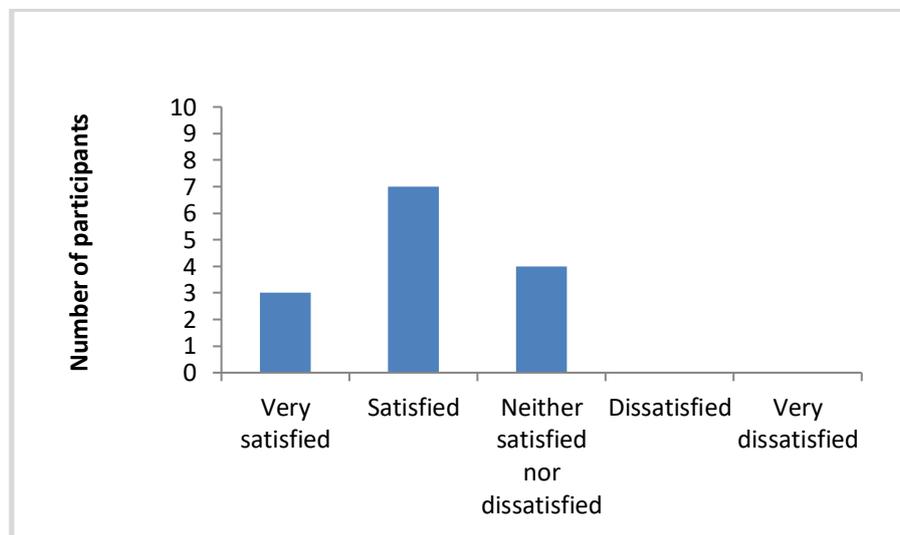
Six respondents made comments. Three respondents felt that the messaging and signs need to be more consistent. Two felt that the signs need to be more visible and in the right locations across the region and that these need to be consistent with the information on the websites. One respondent felt that having multiple types of signs may lead to mixed messages.

One respondent felt that the signs do work if they are clear and in the right locations and one felt that there should be more use of social media platforms (e.g. Facebook, Instagram, Twitter and community web pages). However, one person felt that the signs are frequently ignored by the public.

Question 10

How satisfied are you with inter-agency communication?

Fourteen participants answered this question. The majority (10 out of 14 respondents) were generally satisfied with inter-agency communication, whilst four were “neither satisfied or dissatisfied”.

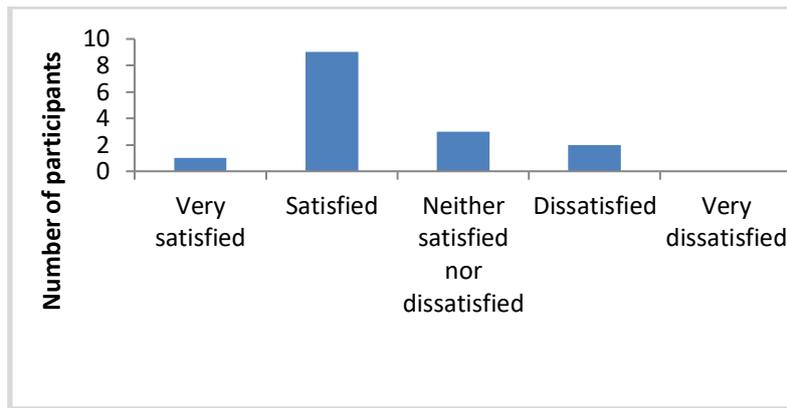


One respondent commented, and stated that test results which necessitate an action should always be followed up with phone call and not just communicated via email.

Question 12

Are you satisfied with the consistency of messaging from all organisations (Regional/District Councils and the Public Health) to the public?

Fifteen participants answered this question regarding their satisfaction with the consistency of messaging from all organisations to the public? Whilst the majority (10 out of 15 respondents) were generally satisfied, three were “neither satisfied or dissatisfied” and two were dissatisfied.

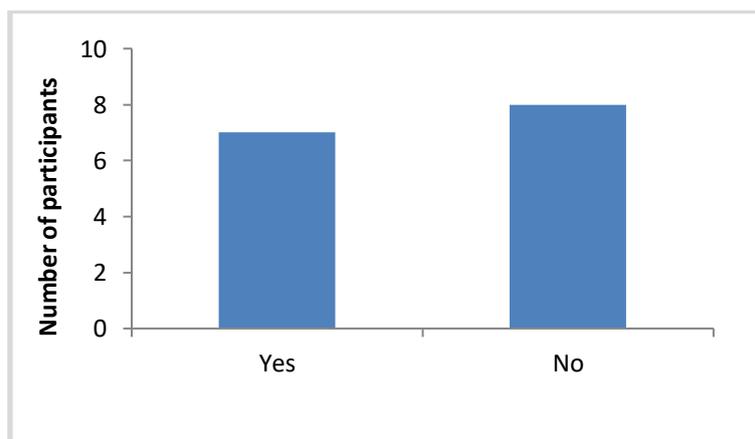


Two respondents provided further comments. They felt that different signs may be confusing and were in favour of a more consistent approach using standardised signs.

Question 13

Do you think enough is being done to educate the general public about the risks of swimming in areas where water quality results have been exceeded?

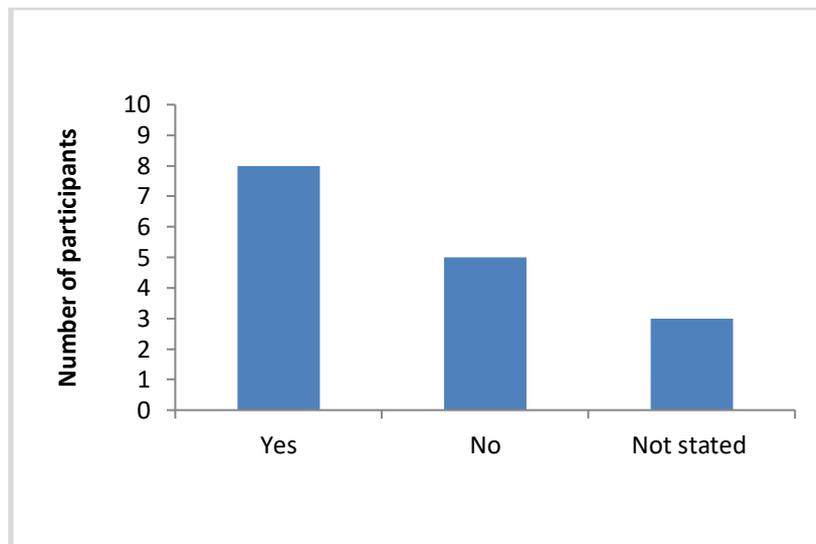
Of the fifteen respondents that answered this question, just over half (8 out of 15 respondents) felt that not enough is being done to educate the general public about the risks of recreational water in areas where water quality results have been exceeded.



Question 14

Do you think Iwi are adequately informed of testing results and / or actions?

Half (8 of the 16 respondents) that answered this question felt that Iwi are adequately informed of testing results and / or actions. However, almost a third (5 out of 16 respondents) felt that they are not adequately informed and three participants did not state an answer.

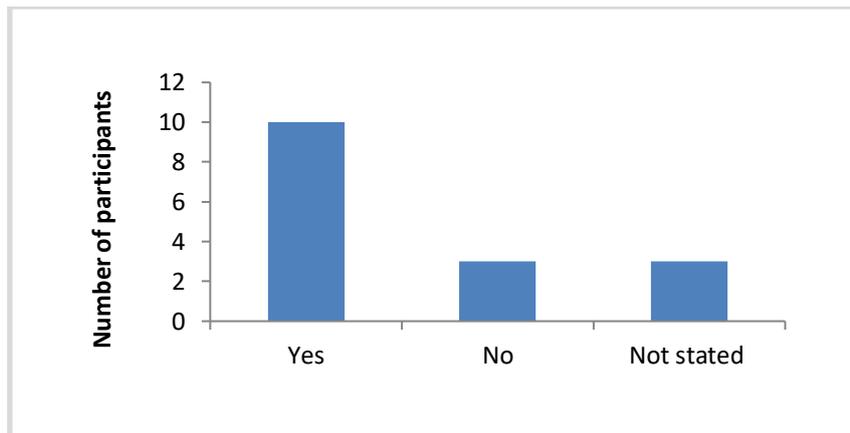


Five respondents made additional comments indicating that more work may need to be done in this area. One respondent suggested that a public education programme could act as a starting point and one respondent felt that all Iwi should be informed of test results and/or actions. Two respondents highlighted that the information needs to be in a form that can be easily understood. One respondent felt that information should only be shared once action decisions have been made in order to avoid misunderstanding and unnecessary angst.

Question 15

Are there Iwi in your region who have asked for data or education about the safety of recreational waterways?

Of the thirteen respondents, the majority (10 out of 16 respondents) noted that Iwi have asked for data or education about the safety of recreational waterways.



Six respondents commented. There have been direct requests to the district councils and TRC that have been responded to. Nga Ruahine have requested water quality results and Ngaa Rauru Kiihahii requested a workshop on 'E.coli'. Information has been requested, but this has usually been after the event and it should be the norm so that Iwi have an increased understanding of the programme for when exceedances occur. Iwi have also asked for information about why the results are high and what is being done to address this.

Question 16

What improvements would you like to see made to the programme?

Seven respondents suggested improvements. These included;

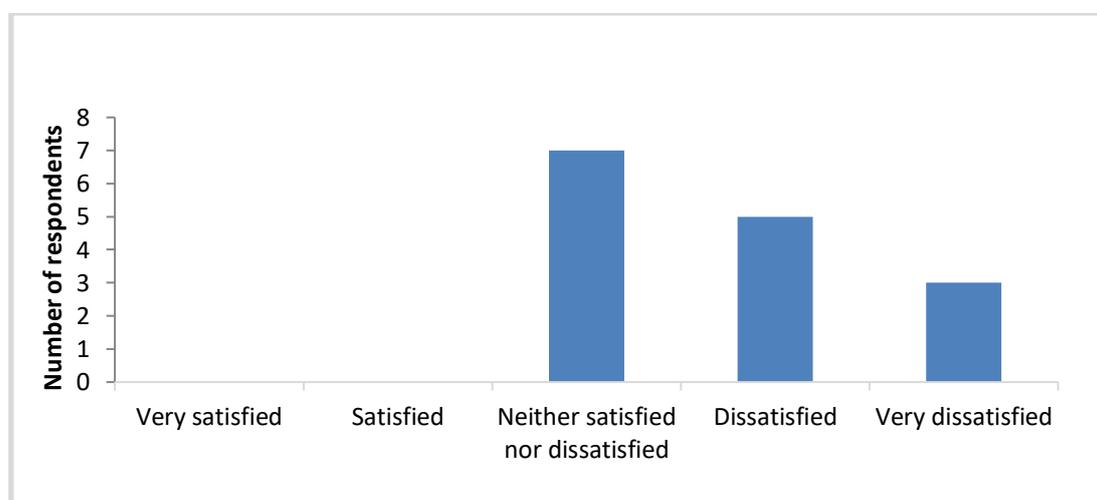
- a review of the current sampling locations
- a community education programme, led by TDHB (for e.g. on E.coli and the risks associated with it)
- keeping up to date with technology - to produce faster results and better measures of pathogen presence
- continual improvement in public education
- more co-ordination between the agencies
- consistent signage across regions
- an emphasis on community education so that people know not to swim after heavy rainfall

Survey 2 - Iwi responses survey responses regarding the current summer recreational water quality monitoring process

Question 1

How satisfied are you with the current summer recreational water quality monitoring process in your rohe?

There was some general dissatisfaction with the current summer recreational water quality monitoring process amongst Iwi. Of the 15 respondents, 8 were either dissatisfied or very dissatisfied and 7 were neither dissatisfied nor satisfied.



Ten respondents made comments. Two respondents expressed dissatisfaction with signage. One respondent noted an occasion when signs had not been put out. They also said that they had been told that STDC only have signs for water contamination arising from municipal facilities. This respondent felt that STDC should be supplied with specific warning signs. Another respondent felt that signs are not well displayed at entrance ways to rivers and popular swimming areas.

Three respondents had concerns about how testing is conducted. Two felt that testing is only conducted under conditions that are more conducive to favourable test results (i.e. avoiding testing during low tides and after heavy rainfall). One respondent also felt that the recorded testing dates suggest that staff may have gone on holiday over summer. One suggested that testing should be performed throughout the year round (to account for other high users such as surfers and “boaties”).

Three people raised concerns about the suitability of testing sites. In general, it was felt that there needs to be more rigor in site selection to ensure high use sites (e.g. Skinner Rd in Patea) are monitored and that an increase in number of testing sites would be a more comprehensive approach. It was suggested that testing popular sites near the larger towns is not a fair representation of where people swim. Although it was noted that some testing sites have been returned positive tests for bird DNA, one respondent felt that a review of sites is warranted as they felt that people do not tend to swim near waterways inhabited by fowl.

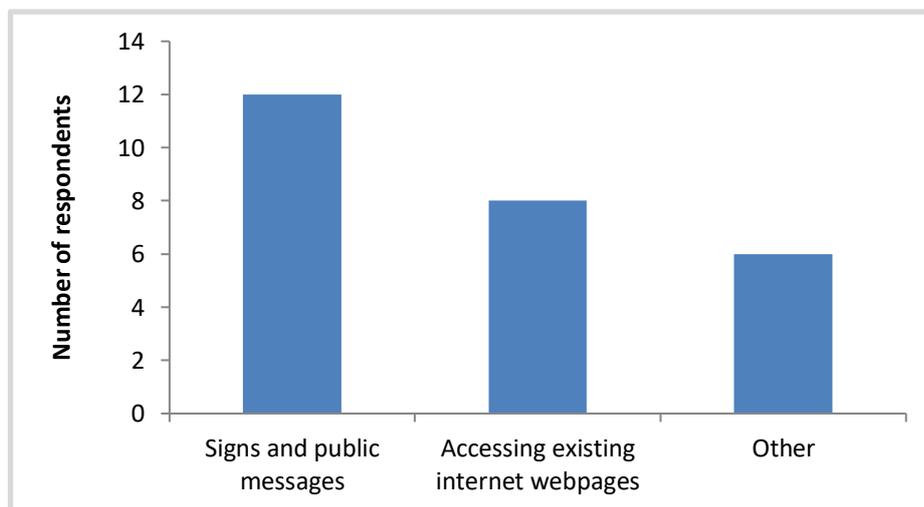
One respondent was dissatisfied with the communication from those involved in the programme. They felt that information should be passed directly to Iwi in a timely manner so that their Iwi can help disseminate information using their own communication resources. Another respondent felt that there is no reference to cultural interaction in reporting the state of the waterways. These two comments imply that Iwi may be able to provide support the programme.

One respondent felt that there was a lack of willingness to take ownership for the process and that there should be penalties if signs are not erected in timely manner. One respondent expressed deep concern about regarding the polluted state of our waterways. One felt that very little work is being done and that it is inconsistent, whilst another expressed that they are seeing little improvement in water quality and felt that this suggests that it is not being monitored as it should. Another felt that more effort should be focussed on fixing problem areas and rather than monitoring trends across the region.

Question 2

How would you like to be informed about whether it is safe to swim in rivers, streams and beaches in your rohe?

Whilst respondents were supportive of the current modes of communication (ie. signage and existing websites), 6 respondents noted that they would also like to receive information via other modes of communication.



Eleven respondents made comments. Direct contact with Iwi via prompt emails, text and social media was a common request. This would enable information to be shared by Iwi/pa/marae/hapu communications (e.g. websites, Facebook and newsletters). The use of a text alert phone app was

suggested by two respondents. One respondent would also like to be emailed regarding the safety of taka kaimoana (which also includes eels and watercress).

One respondent requested regular reports at the beginning, middle and end of the swimming season and then quarterly during the year. This would inform them of trends and provide the opportunity to ask questions if concerned. Another respondent supported results being shared on city council websites.

One respondent provided positive feedback about the new signs in their rohe but suggested that there needs to be more of them, that they need to be updated frequently and that they should include health messages on them (e.g. what to look out for and when to seek help). They felt that this may encourage more people to see their doctor and report illnesses. Another respondent would like permanent swimming notice boards in their rohe that can be easily changed between “safe” or “unsafe to swim” by council staff.

It was also suggested that Iwi should be involved in the sharing of information including signage and public messages.

Question 3

The laboratory test results are available on the Taranaki Regional Council, district council and Land, Air and Water Aotearoa (LAWA) webpages. Would you like the water laboratory test results to be made available via another platform (e.g. email etc)?

Almost 80% of participants would like laboratory results to be made available via other platforms. Of the thirteen who commented, most wanted the results directly made available. One respondent noted that if there is an issue, that they would like to be notified directly and provided with details. Direct email contact was a common suggestion. One respondent requested a phone call or text to inform them that the results are available and have been emailed. The use of social media (e.g. Facebook and Iwi webpages), apps and creating a Facebook page per sampling site were other suggestions.

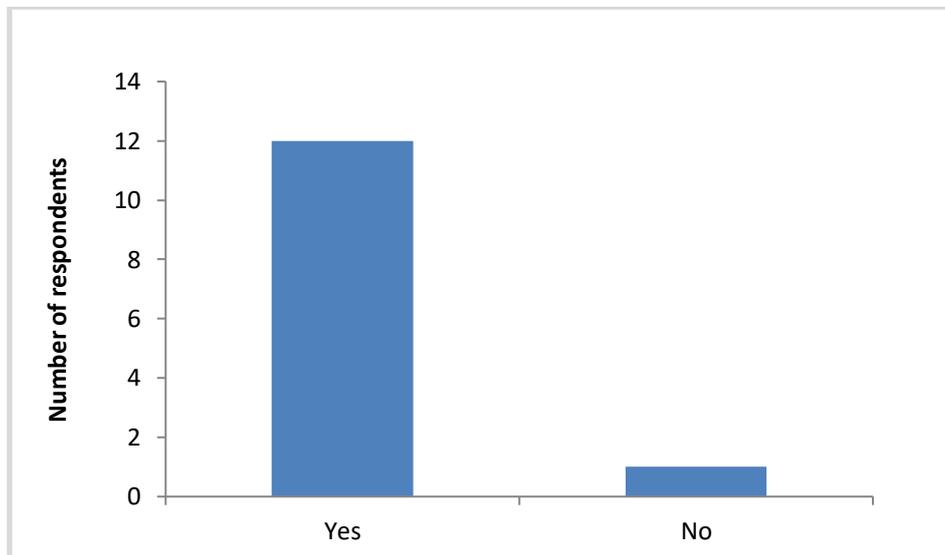
Rather than trying to find the information for themselves, prompt, simple, meaningful and personalised results would be welcomed. However, one respondent said they were happy to download them after direct notification that they were available.

One respondent mentioned that they only wanted the results if they were meaningful and that they want confirmation that tutai is not being pumped into the sea. Another respondent suggested easy to understand coding (e.g. a colour coded key) to assist with interpretation and comments related to the safety of kai (e.g. watercress).

Question 4

Would you like to have training in the interpretation of water quality tests?

Nearly all (12 of the 14 respondents) said that they would you like to have training in the interpretation of water quality tests.



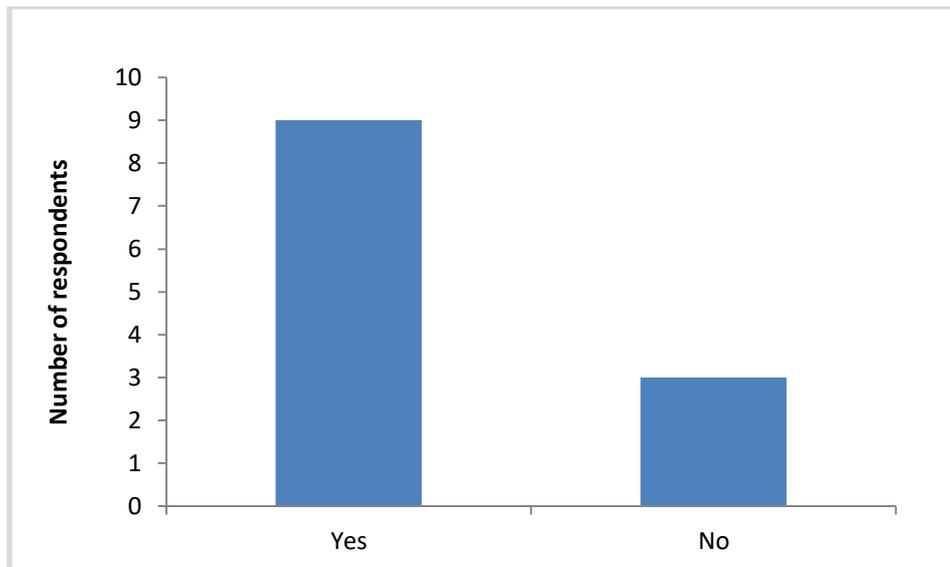
Ten respondents commented. Suggestions included;

- TRC led Iwi training
- having training in monitoring methodology as well as in the interpretation of test results
- training hapū environmental monitors
- educating school children about water quality
- on online e-learning tool or short weekend workshop
- having multiple training venues e.g. New Plymouth, Stratford, Hawera, Patea, Waverley, etc
- conducting meetings with iwi/hapū e.g. at Pa/marae Trustee hui – an online learning tool and ongoing activities could be used to reinforce learning
- one respondent felt that they would only want training if the quality standard was set by manawhenua
- being made aware of new tests as they become available

Question 5

Do you have any suggestions as to how the summer recreational water quality monitoring process could be improved?

Twelve of the 15 participants responded. The majority (9 of the 15) said they had suggestions as to how the summer recreational water quality monitoring process could be improved.



Twelve respondents chose to make comments/suggestions and these are summarised below;

- a review of the appropriateness of testing sites; conducting a public survey, and working with Iwi and hapū to identify all relevant sites for testing
- engage with and train communities
- an awareness campaign to increasing understanding of the process amongst the general public and Iwi and to ensure that people know that it is unsafe to swim after heavy rain
- reviewing the way results are given to Iwi ; notifying Iwi of testing dates, sites and when to expect results
- informing Iwi of the outcome of the monitoring including investigation into sources of contamination, solutions and actions taken (e.g. recurring contamination after heavy rain etc.)
- involving Iwi in the monitoring process, particularly regarding sites within their rohe
- integrating with (but not limited to) the National Policy Statement for Freshwater Management, Regional Freshwater and Soil Plan, Central Government’s target of clean water: 90% of rivers and lakes swimmable by 2040, regional and district council resource consent process (land use, water abstraction and discharge, etc.), adequately reported in the State of the Environment, etc.
- employing a TDHB Environmental Policy Advisor/Manager with expertise in cultural, environmental, health and well-being including associated legislations, non-compliance monitoring and investigation that will address legislative (statutory and non-statutory) requirements.
- reviewing monitoring measures and aiming to ensure they are more responsive to Māori needs, including; cultural measures, employing Iwi/hapu monitors to conduct the testing and actively assessing risk associated with swimming and kai
- prioritising risk over monitoring trends
- a shift beyond monitoring to powerful actions – this will reduce the need to monitor
- the TRC mandating that discharges to the sea will not be permitted.

Question 6

If you think there are water sampling sites (e.g. popular swimming/bathing rivers, streams and beaches) in your rohe that are not being tested please name/describe them below.

Respondents provided general suggestions and noted specific sites. A common suggestion was to review testing sites for their relevance and to increase the number of sites. One respondent noted that not all sites within their rohe are tested annually and another mentioned that some trained “locals” have been testing at Matanehunehu. It was suggested that unused sites should still be tested as people would swim there if they could (e.g. at the Egmont Boat Ramp area).

Suggested sites included;

1. Marae and papakāinga sites close to rivers.
2. Waitootara river - multiple points
3. Kai Iwi Stream
4. Patea river (including Skinner Rd)
5. Whenuakura stream
6. Waingongoro
7. Kaipokonui including Skeet Rd & Kaponga
8. Waingongoro at Normanby Rd (at the weir)
9. Matanehunehu
10. Mimitangiatua
11. Parininihi
12. Onaero beach
13. Manga-o-Raka at Te Arei Rd West bridge
14. Wai-o-Ngana river near beach area
15. Egmont Boat Ramp

Question 7

Please leave any additional comments you have below

Four respondents made additional comments and expressed a strong desire for Iwi to be more involved in the recreational water monitoring process, especially regarding site monitoring and including cultural values and knowledge.

One respondent did not have any past experience with the programme and would like the opportunity to better understand the process and participate.

Having more Iwi involvement in the programme was seen as a way to build stronger relationships between Iwi authorities, TDHB and TRC. It was noted that Iwi and hapū are the kaitiaki and that we should be encouraged to think about how a partnership can be formed that utilises their knowledge, time and skill.

Suggestions included using a Mātauranga Māori approach in monitoring, an online learning tool and graphing system.

Summary of findings

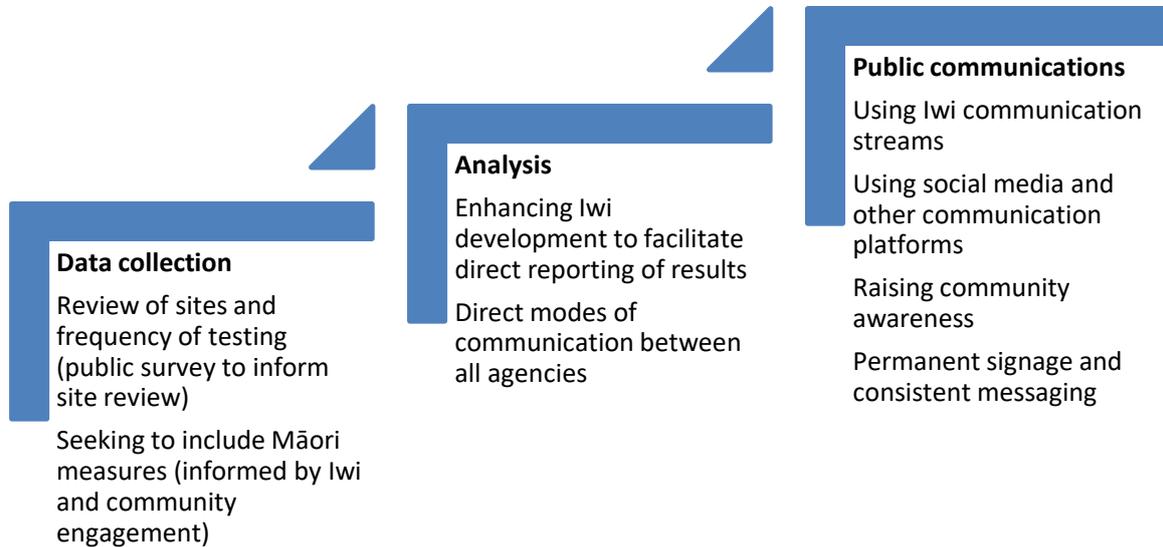
Territorial authorities have a shared understanding of their roles and responsibilities and of their dissatisfaction with the programme was associated with public communication activities. Their suggested improvements for the programme include; reviewing testing site locations, reviewing the timing and frequency of testing, increasing timeliness of reporting of results, increased coordination between agencies, more consistent messaging and signs, using social media and other communication platforms, increasing public awareness of the programme and the health risks associated with using recreational waterways. Approximately a third of participants felt that Iwi are not adequately informed of testing results and / or actions and it was also noted that this information needs to be conveyed in a form that can be easily understood.

Iwi felt the programme could benefit from more accountability and ownership and a stronger focus on reducing health risks and fixing problem areas. They also felt that monitored sites need to be relevant and testing should be performed regularly and possibly even throughout the whole year. More regular reporting may also be welcomed. Iwi were positive about the new signs and more permanent signs were requested. Areas for improvement included; signage that is specific to the type of contamination, including health messages on the signs about common symptoms and the importance of seeking medical attention, and making signage more visible and ensuring that signs are placed in a timely manner. There was a strong desire from Iwi to be trained about the testing methodology and data interpretation and to be more involved in monitoring. They also requested prompt and direct communication of results/actions (including those with an impact on kaimoana) via other streams of communication (e.g. social media) and would like to be more involved in public communications and raising awareness. They suggested engaging with the community and Māori to ensure the process is more responsive to Māori and that measures are culturally meaningful.

DISCUSSION

The review has demonstrated some common areas that all participants feel could be improved. This alignment includes; improved communication between councils, Iwi, Taranaki Public health and with the general public, increasing Māori and community engagement and awareness, and ensuring testing sites are relevant and ensuring consistent and permanent signage. These are summarised by programme activity in the figure below.

Suggested improvements for each programme activity



To our knowledge, this approach of seeking Iwi opinion regarding recreational water monitoring processes using an online survey is a novel approach. Local Iwi have expressed a desire to be increasingly involved as a decision maker in matters pertaining to wai and any changes made would be in keeping with recent progress made in other regions of Aotearoa.

Over recent years, efforts have been made to increase coordination of activities undertaken by territorial authorities and Taranaki Public Health. This may explain the high degree of shared understanding of roles and responsibilities amongst these organisations. Iwi have had a less active role and this may have contributed to their level of satisfaction with the programme. This review has taken steps towards elucidating their needs and how they would like to see the programme improved.

The importance of *wai* (water) is omnipresent across multiple dimensions of Māori life (6). For Māori, wai is a sacred and vital life-giving force (6). It imbues *mauri* (life essence) and contributes to spiritual and physical health and wellbeing (5, 6). Furthermore, our waterways are a taonga (treasure) (5) that warrants protection. From a Māori perspective, the degradation of our waterways is a stark reminder of the processes of colonisation and urbanisation, and the loss of ancestral knowledge and their interconnectedness with nature (6).

Iwi felt that more should be done to reduce the likelihood of exceedance events by concentrating more on the removal of sources of contamination. There is also growing concern amongst New Zealanders about the pollution of our waterways from 'big agriculture' and a desire for stricter rules (8, 9). Currently, the TRC's riparian management programme aims to improve the water quality of rivers and streams near dairy farms (10). However, the main focus of the summer recreational water monitoring programme is ensuring that the public are informed of the health risks in time for them to make informed decisions about whether to enter the water. The duty for District Councils to abate situations

which are likely to be injurious to health under the Health Act 1956 usually simply means informing the public in the case of faecal contamination of waterways. Empowering Regional and District Councils with the responsibility to mandate the removal of contamination sources may require robust legislative reform.

A number of documents have identified the need for “collaborative planning” and “iwi/Maori involvement in freshwater planning and decision-making”(11). Frameworks have been developed to increase iwi/Maori participation in freshwater management and there are cultural monitoring tools could augment recreational water monitoring within Taranaki (11). In some regions, councils are starting to meet their Tiriti obligations by entering co-governance arrangements with iwi through the RMA (5, 6, 12). Encouraging the use of kaupapa Māori frameworks for assessing river conditions is a key recommendation to improve river health assessment and to incorporate the interconnections between human use and ecological values (13). Communities, including Iwi, should also be encouraged and supported to engage with monitoring and this information should help inform management decisions (13). New technologies must be sought, developed and embraced (13).

The true population health burden of microbiologically contaminated waterways is difficult to measure but is likely to be significant. Although some of the implicated diseases can also be acquired from other sources, the number of cases reported to public health may only represent a small fraction of the number of the actual cases in the community. For example, it has been estimated that for every case of campylobacter disease notified, approximately 222 cases are not reported (14). Therefore, there is a need continually review and improve our processes in order to protect public health. Whilst the findings of this review demonstrate that the programme may be working adequately from an operational perspective, some changes are required in order to realise the suggestions of the respondents.

The author suggests the following recommendations;

i) The establishment of a working group

The programme may benefit from establishing a small working group to develop and actualise the suggestions made above by the survey participants. This working group would be chaired by the Medical Officer of Health for Taranaki DHB.

The aims of this group could include;

- developing the programme into a centre of excellence for Aotearoa
- ensuring that best practice is achieved use of up-to-date technologies and culturally appropriate methodologies and modes of communication
- constantly identifying potential opportunities to improve communication between agencies and with Iwi and the general public
- increasing co-ordination and better communication between agencies, Iwi and the public
- focusing on reducing health risks
- focusing on cultural safety
- advocating for legislative changes that improve the state of the waterways

Currently there is a MFE funded education programme, led by a freshwater ecologist, that trains iwi, hapu, marae and schools to monitor, manage and action freshwater problems. There may be scope to collaborate with and build upon this programme.

In addition to the scientific and technical representatives from the TRC and district councils, this group should include local Iwi representatives with an understanding of environmental health and/or the monitoring process, communications support and Taranaki Public Health. Taranaki Public Health can support the working group by facilitating engagement with stakeholders (including Iwi and community groups).

Members to include;

- Iwi representatives
- Freshwater Ecologist(s) with an understanding of Māori tikanga
- Scientific/technical advisor (s)
- Taranaki Public Health
- Communications

ii) The working group executes the following proposed actions

Feedback from the survey participants has informed the following suggested actions for the working group. These actions will require engagement with Iwi and community groups early in their development phase.

- Public survey post 2018 - 2019 season
 - surveying the general public and high-use groups regarding;
 - current use of waterways to inform testing site review
 - satisfaction with and awareness of the programme
- Ongoing review of data collection methods and testing sites
 - off season review of the current sampling locations (public survey to inform site review)
 - review data collection methods and frequency of testing
 - ensure measures are culturally relevant (informed by Māori and community engagement)
- Iwi training pack and strategy
 - to share knowledge about the monitoring methodology and data interpretation
 - to enable interpretation of test results
- Ongoing public awareness programme
 - Increase awareness about the programme and the risks associated with swimming after heavy rainfall
 - focus on Iwi, schools, high user groups
 - perform post season evaluation of effectiveness of awareness programme each season
- Communications strategy

- ensure consistent messaging
 - advocate for permanent signage
 - focus on use of social media and other communication platforms
 - increased timeliness of reporting of results using direct communication between agencies and Iwi
 - empower Iwi to share information using their own communication platforms
- Evaluation
 - Develop process, Impact and outcome evaluation plan that can be used each season
 - This may include an improved stakeholder and public survey

It must be acknowledged that this review has important limitations. The author is not an expert on water recreational water quality monitoring or the programme used in Taranaki. This work would have been improved by more thorough initial consultation with Iwi and the operational/managerial staff of territorial authorities. This may have enabled a more shared understanding of the aims of this review and facilitated a better co-designed ad-hoc evaluation.

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APPENDICES

Appendix 1 - The Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas 2003 (2) provide a framework

- i. The regional council co-ordinates the monitoring and reporting strategy.
- ii. The regional council implements surveillance and alert-level monitoring.
- iii. The Medical Officer of Health reviews the effectiveness of the monitoring and reporting strategy.
- iv. The regional council informs the Medical Officer of Health and territorial authority if alert or action levels are reached.
- v. The Medical Officer of Health will ensure that the territorial authority is informed.
- vi. The territorial authority will inform the public when the action level is exceeded – the Medical Officer of Health will ensure the public is informed within agreed timeframes.
- vii. If the action level is reached, the territorial authority will undertake nuisance monitoring and cause all proper steps to be taken to abate or remove the nuisance. On occasion it may be more appropriate for the regional council to undertake this duty. The Medical Officer of Health will provide advice and ensure that proper steps are taken by the territorial local authorities and/or regional councils.
- viii. It is the responsibility of the Medical Officer of Health to ensure that sites with modified grades are audited in accordance with these guidelines.
- ix. The regional council will collate the information for state of the environment reporting and a review of management policies (2).

Appendix 2 - Adapted versions of online surveys

Survey 1 – for TRC, district councils and Taranaki Public Health staff

Question 1

Do you think current recreational water quality programme is meeting national standards, as set by the 2003 Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas? (e.g. are we meeting standards for sampling criteria, the setting of roles and responsibilities etc)

Yes

No

Please explain why you think this is

Question 2

Do you know which organisation is the lead agency for the following activities? (please select one option per row)

Data collection (essentially water sampling)

Taranaki Regional Council

District Councils

Taranaki DHB (Public Health Unit)

Don't know

Analysis (checking results against guidelines)

Taranaki Regional Council

District Councils

Taranaki DHB (Public Health Unit)

Don't know

Public communication (erecting signs and public messages)

Taranaki Regional Council

District Councils

Taranaki DHB (Public Health Unit)

Don't know

Question 3

In an ideal world, which organisation do you think should be the lead agency for each activity? (please select one box per activity)

Data collection (essentially water sampling)

Taranaki Regional Council

District Councils

Taranaki DHB (Public Health Unit)

Analysis (checking results against guidelines)

Taranaki Regional Council

District Councils

Taranaki DHB (Public Health Unit)

Public communication (erecting signs and public messages)

Taranaki Regional Council

District Councils

Taranaki DHB (Public Health Unit)

Are there any activities not captured here? If so, what are they?

Question 4

How satisfied are you with data collection (water sampling) activities?

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Dissatisfied

Very dissatisfied

Question 5

Do you have any suggestions for how data collection/water sampling could be improved?

Yes

No

Comments

Question 6

Do you think the data collection / water sampling is being undertaken at the right locations?

Yes

No

Comments

Question 7

How satisfied are you with analysis activities? (checking water quality results against relevant guidelines)

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Dissatisfied

Very dissatisfied

Question 8

Do you have any concerns regarding analysis?

Yes

No

If yes, please comment and suggest how this activity might be improved

Question 9

How satisfied are you with the public communication and the erecting of signs and public messages?

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Dissatisfied

Very dissatisfied

Question 10

Do you have concerns regarding public communication?

Yes

No

If Yes, please comment

Question 11

How satisfied are you with inter-agency communication and the way the different councils and Taranaki Public Health Unit communicate with each other?

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Dissatisfied

Very dissatisfied

Question 12

Are you satisfied with the consistency of messaging from all organisations (Regional/District Councils and the Public Health) to the public?

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Dissatisfied

Very dissatisfied

If you are unsatisfied or have concerns please explain below

Question 13

Do you think enough is being done to educate the general public about the risks of swimming in areas where water quality results have been exceeded?

Yes

No

If no, please suggest what could be done and by whom

Question 14

Do you think Iwi are adequately informed of testing results and / or actions?

Yes

No

If no, please suggest could what could be done and by whom?

Question 15

Are there Iwi in your region who have asked for data or education about the safety of recreational waterways?

Yes

No

If yes, please describe the support requested and if anything has been done about it?

Question 16

What improvements would you like to see made to the programme?

Question 17

Please specify which organisation you work for

Taranaki Regional Council

New Plymouth District Council

Stratford District Council

Taranaki Public Health (DHB)

Survey 2 – for Iwi representatives with an understanding of environmental health and/or the programme

Question 1

How satisfied are you with the current summer recreational water quality monitoring process in your rohe?

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Dissatisfied

Very dissatisfied

Please explain if you are not satisfied with the current process

Question 2

How would you like to be informed about whether it is safe to swim in rivers, streams and beaches in your rohe?

Signs and public messages

Accessing existing internet webpages

Other

Please make any other suggestions below

Question 3

The laboratory test results are available on the Taranaki Regional Council, District Council and Land, Air and Water Aotearoa (LAWA) webpages. Would you like the water laboratory test results to be made available via another platform (e.g. email etc)?

Yes

No

If you answered yes, please describe how you would like test results to be made available?

Question 4

Would you like to have training in the interpretation of water quality tests?

Yes

No

If yes, please comment below

Question 5

Do you have any suggestions as to how the summer recreational water quality monitoring process could be improved?

Yes

No

Please make any suggestions below

Question 6

If you think there are water sampling sites (e.g. popular swimming/bathing rivers, streams and beaches) in your rohe that are not being tested please name/describe them below.

Question 7

Please leave any additional comments you have below

Your responses will be kept anonymous in any written reports. However, please feel free to specify which Iwi you are representing in this survey in the box below. This will help us to tailor the any actions to the needs of your Iwi.

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